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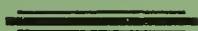
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ROYAL ONTARIO MUSEUM

ANNUAL REPORT

of the

**ROYAL ONTARIO MUSEUM OF ZOOLOGY
AND PALAEONTOLOGY**



1950 - 51

ROYAL ONTARIO MUSEUM
OF ZOOLOGY AND PALAEONTOLOGY
Annual Report for 1950-51

DIVISION OF VERTEBRATE PALAEONTOLOGY

Associate Curator - L. Sternberg
Senior Technician - R. R. Hornell

Accessions: Two months were spent in the Bridger formation (Middle Eocene) of southwestern Wyoming. The purpose of this expedition was to collect fossil mammal material much needed for teaching, and for gallery exhibitions. Seventeen major specimens were collected, which included skulls, partial skeletons of mammals, two turtles and one crocodile skull, together with numerous partial jaws, teeth and odd bones of mammals.

A second expedition was conducted in the Milk River formation, Upper Cretaceous, of southern Alberta, in order to prospect extensive Badlands that had heretofore not been thoroughly examined by experienced collectors. It was hoped that evidence of the immediate ancestors of some of the dinosaurs now on display in the Museum would be found. Although no complete skulls or skeletons were found, a number of odd bones and teeth were collected.

Preparation, Registration and Maintenance: The most outstanding addition to the gallery was an open mounted skeleton of an aquatic Rhinoceros, Teleoceras fossiger, from the Pliocene formation of western Kansas. In addition, more than eight feet of the restored portion of the tail of the Corythosaurus dinosaur (open mount) was replaced, in which a new method of hardening plaster casts was used in order to prevent further damage being done by visitors. Preparation was completed on all material collected in 1949 from the Cypress Hills, Saskatchewan. Some work was done on Eocene (Wasatch formation) mammal material collected in Wyoming in 1949. Twenty-eight molds and plaster casts were made of small blocks of rock showing small Trilobites for the Division of Invertebrate Palaeontology. Four plaster casts of large Mastodon models were made and coloured, for sale or exchange to other museums. Plaster casts were made of three dinosuar skulls and sent to the British Museum in an open exchange agreement. Some preparation was done on Middle Eocene of Wyoming mammal material collected in the summer of 1950. Assistance was given the Museum of Geology and Mineralogy in casting a model of the Chubb Crater. A great many storage specimens were given new labels and their numbers changed.

Two new exhibits are in progress: One is a diorama with painted background showing a habitat group, in miniature, of the Mastodon. A second exhibit is to be a revised series of models, skulls, feet and teeth showing the evolution of the horse.

Material Catalogued:

Fossil fish specimens	200
Fossil mammal specimens	<u>100</u>
Totals	300

Maintenance: Considerable time was spent on the maintenance of the fossil vertebrate galleries. All skeletons and skulls, not protected by glass, were cleaned and retouched. All of the standard cases were cleaned, both inside and outside. It was necessary to remove and replace all small specimens. Many faded labels were replaced.

Research: Dr. L. S. Russell, Research Associate, is making a complete study of all the fossil mammal material collected in Saskatchewan in 1948 and 1949. All determinations have been made on smaller mammals and the work on larger specimens is progressing. Dr. Russell has published a preliminary account of the geological significance of these faunas.

Public Relations: Much information on the technique of molding with liquid latex was given to persons engaged in industry, as well as to members of the staffs of some of the other museums. A visit was made to the Toronto Transportation Commission subway excavations at Yonge Street and St. Clair Avenue to identify bones found some ten feet below the surface. Dr. A. S. Romer, Vertebrate Palaeontologist and Director of the Museum of Comparative Zoology, Harvard University, spent three days at the Museum, making detailed study of one of our type dinosaur skulls.

DIVISION OF MAMMALOGY
Curator - R. L. Peterson

Research Assistant - S. C. Downing
Technician - L. A. Walden

Accessions: A total of 517 specimens was received by the Division during the year. This is a reduction from the number last year, principally brought about by the more critical selection of desired material furnished by the Ontario Department of Lands and Forests and the absence of major field parties. The Department of Lands and Forests continued to be one of our most important contributors of specimens, especially of valuable fur bearers. During the year it provided 115 specimens including six western Ontario bobcats which have greatly facilitated the Division's research on this group. Other noteworthy accessions include staff-collected specimens from Wyoming, British Columbia and Pelee Island, Ontario; a donation of British Columbia mammals by Mr. A. Brooks; and a purchase of a collection of Arctic mammals.

Nature of Specimen	By Donation	By Staff Collection	By Exchange	By Purchase	Totals
Unprepared	100	215			315
Partially	73			76	149
Prepared	44		9		53
Totals	217	215	9	76	517

Preparation, Registration and Maintenance: The preparation of material, particularly the cleaning, degreasing, numbering and treating with a plastic compound, of skulls and skeletons, has kept well ahead of new material received. Cataloguing, however, has fallen seriously behind due to an extremely busy research program and the absence of student assistance that was available last year. The entire card catalogue files of the collection were rearranged and expanded to the subspecies level and a synoptic inventory of the collection was started. The inventory and rearrangement of the osteological collections, started last year, was completed. The work of the Division was facilitated immeasurably by the acquisition of the entire fourth floor rotunda as a research laboratory. Here the lighting conditions and available space now make it possible to satisfactorily assemble and study large series of specimens. In addition, a set of portable examination tables and wooden storage cabinets have been added to this new working space.

The Division's Technician has designed and installed a new degreasing apparatus which shows great promise for improved quality in future osteological research material.

Preparation:	Registration:
Skins	128
Hides (prepared for tanning)	2
Skulls	609
Skeletons	24
Totals	763
	373

Research: The major research program of the Division concerned the preparation of a final manuscript for a book on North American Moose by the Curator. This manuscript has now been completed and is ready for publication.

The Curator, in collaboration with Mr. A. de Vos, Biologist, of the Ontario Department of Lands and Forests, completed a manuscript on the status of Woodland Caribou in Ontario, which is now in press of the Journal of Mammalogy.

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A taxonomic study of the red squirrels (Tamiasciurus hudsonicus) of eastern Canada was carried forward.

The study of bobcats of Ontario by the Curator and Research Assistant has been expanded into a taxonomic review of this form in eastern Canada and is nearing completion.

The Curator, in collaboration with three graduate students (Messrs. R. Standfield, E. McEwen and A. Brooks) carried out a research program on various aspects of the red foxes of Canada including their distribution and taxonomic status. This project is nearing completion and a portion of the results obtained will be submitted for publication.

The Curator spent most of one week at the National Museum of Canada studying specimens in connection with the above research projects. In addition, the following institutions have loaned specimens to the Division for one or more of the above studies: Universities of British Columbia, Kansas, Michigan, Montana; Cornell University; Montana State College; Museum of Comparative Zoology, Harvard; New York State Museum; Carnegie Museum; Minnesota Museum of Natural History; Chicago Museum of Natural History, and the National Museum of Canada.

In connection with the research of other institutions, specimens were lent to workers in the University of Connecticut and McMaster University. Mr. Austin Cameron of the National Museum of Canada visited the Division and studied its collections.

Education and Public Relations: The Curator offered an advanced research course in Mammalogy to three graduate students in the University of Toronto and served on the graduate examining committee of three graduate students. He also conducted mammalogy sections of Course 25 in Zoology as well as the mammalogy and wildlife management portions of the Natural History course for students enrolled in Institutional Management.

The Curator was again re-elected as a member of the Board of Directors of the American Society of Mammalogists for a two-year term and also served on the Membership Committee as well as a special committee appointed to consider the "Dues Status of Retired Members" of that Society. He was also appointed as a member of the committee on "Wildlife Nomenclature" for the Wildlife Society.

The Division continued to provide many services to institutions and individuals in such matters as identification of specimens, and supplying a great assortment of data on mammals. General loans of specimens and lantern slides for educational purposes totalled well over sixty. Graduate students, especially, utilized the Division's Library, specimens and data files and were also counselled and assisted on various research problems.

DIVISION OF ORNITHOLOGY
Curator - L. L. Snyder

Research Assistant - J. L. Baillie
Senior Technician - C. E. Hope

Accessions: Through support of the Carling Conservation Club, two members of the Division's staff carried out field work which added 531 bird specimens to the research collection. The Senior Technician accompanied a palaeontological expedition to southern Wyoming and the Research Assistant made a representative collection of birds on Pelee Island, the southernmost territory of the Dominion of Canada. A valuable gift of 198 skins of southern Ontario birds was received from Mr. G. H. Hammond, Dominion Entomological Laboratory, Marmora, Ontario. Mr. O. D. Boggs contributed 91 study specimens from Alberta. The Ontario Department of Lands and Forests has continued to forward birds in the flesh, mostly waterfowl, casualties from Niagara Falls, and a valuable selection from the 529 birds received has been preserved. Mr. Paul Hahn of Toronto was instrumental in securing another specimen of the extinct Passenger Pigeon for the collection. Two individual items worthy of note are: The receipt of the nest and three eggs of Bewick's Wren, the first to be found in the province; the collecting of a Little Gull at Toronto by the Senior Technician, the first Canadian specimen of this European species. Two small but important Arctic collections were purchased during the year. A residue of the Leonard Bequest made it possible for Mr. L. A. Learmonth to secure 94 bird skins and 10 sets of eggs in the Boothia Peninsula region. Constable W. L. Carey, R.C.M.P., obtained 39 specimens of birds and seven sets of eggs in the vicinity of Eskimo Point on the west side of Hudson Bay.

The Museum's South American collection was increased during the year through exchange with Mr. H. G. Lumsden; in this way 169 specimens from Colombia were added to the collection. An exchange for 17 specimens from Denmark was arranged with the Naturhistorisk Museum, Aarhus. An Ontario specimen of the European Widgeon was received through exchange with Mr. A. A. Wood of Chatham, Ontario.

A table showing the number and nature of specimens accessed during the year follows:

Nature of Specimen	By Donation	By Staff Collection	By Purchase	By Exchange	Totals
Unprepared skins	709	29	133	0	871
Prepared skins	403	553	1	333	1,290
Nests and eggs	11	2	17	0	30
Skeletons	1	0	0	0	1
Totals	1,124	584	151	333	2,192

Preparation, Registration and Maintenance: In addition to 531 specimens collected in the field by staff members, the Senior Technician has prepared 278 specimens in the laboratory. Although the backlog of uncatalogued material remains a major problem of the Division, some advance was made this year. By confining public services to morning periods only and by transferring part of the attention of the Senior Technician to the matter of registration, a total of 2,188 specimens was catalogued and incorporated into the research collection.

The following table records in detail the year's accomplishment in this phase of Museum Work:

Preparation:		Registration:
Bird skins (from the flesh)	632	Bird skins
Bird skins (dry)	149	Skeletons
Skeletons mounted	5	Miscellaneous
Disarticulated skeletons	2	
Miscellaneous	14	
Totals (cleaned and repaired 24)	802	2,188

Research: In collaboration with Mr. H. G. Lumsden, Biologist, Ontario Department of Lands and Forests, the Curator has completed a study of variation in the Cinnamon Teal (Anas cyanoptera) from North and South America. A paper on this subject is ready for press. A book, entitled "Ontario Birds", was completed by the Curator (illustrated by the Chief of Art and Exhibits) and published by the Clarke, Irwin Co. Limited. Also, the Curator has continued his annual census and banding operations in King Township; given some attention to the study of the Snowy Owl (Nyctea scandiaca) migrations, which is an international committee project; furthered his report on the birds of western Ontario; and prepared a Classification of Ontario Birds, based on current interpretation.

The representative collection of the island avifauna of Pelee Island made by the Research Assistant is a noteworthy contribution to Ontario faunal studies. Also, the Research Assistant has continued to contribute his regional and seasonal reports which form a part of an international project. The Senior Technician secured comparative material and field notes of the bird fauna of Wyoming.

The Division has continued to facilitate the research of other institutions and individuals by the loan of specimens, by supplying information and by identifying specimens. During the year material has been loaned to the Museum of Vertebrate Zoology, University of California; the Carnegie Museum, Pittsburgh; the Academy of Natural Sciences, Philadelphia; and the National Museum of Canada, Ottawa.

Education and Public Relations: As in previous years the Curator has given ornithological instruction to University classes. Replacements and additions have been made to the teaching collections, class material requiring special preparation. Ten lectures were given by the staff to non-University audiences.

Identifications of bird material have been made for the Royal Canadian Mounted Police, the Dominion Department of Resources and Development, and the Ontario Department of Lands and Forests. Such services were in connection with importations and legal cases.

Countless enquiries from the general public were given attention by members of the staff and the correspondence of the Division covering all phases of its activities totalled 749 items for the year.

The staff has continued to take an active part in the work of many societies and organizations pertaining to their field of work. The Curator was appointed a Canadian member on a Committee of the International Ornithological Congress and was elected to the Council of the American Ornithologists' Union.

DIVISION OF ICHTHYOLOGY AND HERPETOLOGY
Curator - W. B. Scott

Associate Curator - E. B. S. Logier
Technician - E. H. Taylor

Accessions: Further additions have been made to the Division collection by means of donation and staff collecting. In the main, staff collecting was made possible by funds obtained through the Research Council of Ontario.

Important donations during the year included a collection of fishes from the Atlantic coast through the Atlantic Biological Station, Fisheries Research Board of Canada; Great Slave Lake fishes received through Central Fisheries Research Station, Winnipeg; Newfoundland Salmonidae through the Fisheries Research Board of Canada; collections from Chesterfield Inlet, Northwest Territories, through Canadian Wildlife Service; and a large collection of small fishes from Manitoba through Mr. George Butler of the Manitoba Fisheries Department. Total accessions are shown below:

Nature of Specimen	By Donation	By Staff Collection	By Purchase	By Exchange	Totals
Fishes (lots and individuals)	299	52	-	5	356
Amphibians and reptiles	68	58	-	-	126
Totals	367	110	-	5	482

Preparation, Registration and Maintenance: The rearrangement of the shelf-storage collection commenced last year was completed. The modification of the cataloguing system, commenced two years ago, is now nearing completion. The need for a skeletal collection has been felt for some time, such material being especially useful in identification of fishes and in teaching. For this reason the Curator commenced work in this field and skeletons of approximately twenty species are in various stages of preparation. The ever-present task of maintaining the collections of preserved material has been continued.

A great deal of time and energy was spent in organizing a small but extremely useful Divisional library. The resultant saving in time and effort expended in looking up data for our own use, as well as for associated organizations, has already become apparent.

Material Catalogued:

Fish specimens and lots	165
Amphibians and reptiles	0
Totals	165

Research: The study of the Lake Erie Cisco (Leucichthys) conducted by the Curator, was continued. A publication dealing with the fluctuations in abundance of the Cisco in Lake Erie was published and in addition a paper dealing with the taxonomy of this species is in the course of preparation. While carrying out the fisheries investigations in the Lake Erie district during the past five years a great deal of data was gathered on the food of the blue pikeperch (Stizostedion vitreum glaucum) which is a valuable commercial species. These data are now being assembled and organized to be issued in the form of a report.

Under joint authorship with Mr. D. Omand, Biologist of the Ontario Department of Lands and Forests, a report has been submitted for publication dealing with the introduction of two million yellow pikeperch fry (Stizostedion v. vitreum) into a small lake in the Lake Erie district of Ontario. The following institutions made use of our reference collection: The Fisheries Research Board of Canada; the Quebec Department of Maritime Fisheries; the University of Western Ontario; the Ontario Department of Lands and Forests; the University of British Columbia, and Cornell University.

The Division, and especially the Curator, was also involved in directing a coloured motion picture for the Carling Conservation Club, depicting the life history of the speckled trout in Ontario. The work of the Division Technician in maintaining the live material in connection with the film was especially valuable.

As in previous years, the identification of fishes, amphibians and reptiles has constituted a major task. More than 125 lots involving over 5,000 specimens have been identified for various institutions and individuals including the Ontario Department of Lands and Forests; University of

Western Ontario; McMaster University; Game and Fisheries Branch, Manitoba Department of Mines and Natural Resources; Canadian International Paper Company; Atlantic Biological Station and Newfoundland Biological Station; Dr. A. E. Allin, Fort William, Ontario, and various other interested persons throughout the province.

Education and Public Relations: The Curator gave a course in Ichthyology to graduate students of the University. The Curator and Associate Curator gave lectures to students taking the Institutional Management Course in Natural History. A total of 75 lectures and laboratory classes was conducted by the Division during the year. The collection of original Kodachrome slides of the fishes and amphibians of the province, which is of great value for teaching purposes, has been considerably enlarged.

DIVISION OF ENTOMOLOGY
Curator - F. A. Urquhart

Honorary Curator - E. M. Walker

Assistant Curator - T. B. Kurata

Research Assistant - Miss V. Kohler

We wish to record in this report our deep regret at the death on February 16, 1951, of Mr. Charles E. Corfe, for many years an Associate of this Division. Mr. Corfe's interest was chiefly in Lepidoptera. The thousands of beautifully prepared specimens in our permanent collection are eloquent testimony of his skill and artistry.

Accessions: Through the courtesy of Mr. Huntsman and the Fisheries Research Board, 55 species of Canadian Atlantic Amphipoda were added to the alcohol collection. About 200 spiders (Aranea) were secured from collectors at The Pas and Churchill, Manitoba. As a result of the Pelee Island faunal survey 2,500 spiders were added to the permanent collection.

Mr. C. E. Hope secured some 665 insects, mainly Orthoptera, Diptera and Odonata from Wyoming. Mr. Hope is to be commended for this extra effort on our behalf, which must have occasioned him considerable inconvenience. Staff collecting on Pelee Island yielded approximately 4,000 miscellaneous Insecta and 93 Odonata.

Summary of Accessions:

Nature of Specimen	By Donation	By Collection	By Purchase	By Exchange	Totals
Insects	-	4,758	-	-	4,758
Spiders	-	2,500	-	200	2,700
Other Invertebrates	55	-	-	-	55
Totals	55	7,258	-	200	7,513

Preparation, Registration and Maintenance: Approximately 5,000 insects were pinned during the year for the research collection and for classroom use. The temporary storage boxes which were set up last year to house the alcohol collection of invertebrates proved to be even more unsatisfactory than had been anticipated. The Assistant Curator therefore volunteered to give up his office and laboratory to provide storage space on the third floor. The Assistant Curator's generosity in this regard is exceeded only by his patience and ingenuity in carrying on his work in the cramped quarters of an adjoining cubicle. The installation of the alcohol material, and the transferring of the Assistant Curator's collection of spiders, consumed a great deal of time during the fall and winter.

It was necessary to examine the entire Kitto collection, numbering over 45,000 specimens. Temporary storage had, as anticipated, caused many specimens to deteriorate. Those saved were placed in permanent storage cabinets. To make room for the Kitto collection and other research material, our large collection of foreign Lepidoptera was transferred to temporary storage.

The indexing of separates in the Divisional library was continued. There are now over 300 references to Families of Diptera and 350 references to Families in other Orders. Mention should be made of the fact that the care and maintenance of the insect collection, the separates library, and the many items of business that are carried on by the Division of Insects, was handled entirely by the Research Assistant, Miss Virginia Kohler.

Research: Dr. E. M. Walker, Honorary Curator, has nearly completed descriptions and measurements of the fifty-one species of damselflies (Zygoptera) known from Canada, and of the nymphs of about one-third of this number. He has also prepared keys for the determination of species of the larger genera, and of two instars of the nymphs. In connection with this project, Dr. Walker has made 238 drawings.

The Assistant Curator continued his study of the spiders of Canada. The scope of his work is broadened by the fact that no other Canadian is professionally engaged in such a study.

Education and Public Relations: The Curator, as Technical Advisor to the Department of Health, City Hall, Toronto, assisted with plans for dealing with the termite situation in Toronto. The manuscript for a book dealing with the families of aquatic insects is nearing completion, and some 200 drawings were completed by the Associate Curator of the Division of Ichthyology and Herpetology in this cooperative effort.

The Honorary Curator determined the Odonata collected by the Northern Insect Survey (a cooperative project between the Department of Defence and the Division of Entomology, Science Service). There were several hundred specimens from Labrador; northern Quebec; James Bay; northern Manitoba; Mackenzie District; Northwest Territories; Yukon Territory and northern British Columbia. He also determined a dragonfly nymph collection for Mr. Boustead of the National Museum. This included several

valuable specimens which were then presented to our Museum. Nymphs collected by the Biological Bureau of the Province of Quebec were identified at the request of Professor H. Kleerekoper (McMaster University). A collection of eighty nymphs was determined for Mr. A. G. Edmund, University of Toronto, and presented to the Museum.

Approximately 175 enquiries from individuals and institutions, regarding pest control information, were dealt with during the year. A lecture was given to students of the Ontario College of Art, on Insect Anatomy. Individual assistance was rendered by the Research Assistant to students studying insect design.

Collections on Loan to Other Institutions for Research Purposes:

Aranea	American Museum of Natural History; University of Rochester
Diptera	Harvard University; Communicable Disease Centre, Chamblee, Georgia
Mollusca	Ontario Agricultural College, Guelph; University of Kansas
Copepoda	University of British Columbia

The following courses, involving fifty-three hours of lecturing, were given by the Curator, for the University of Toronto:

- 1) Second year Honour Biology Course in Systematic Entomology,
- 2) Arthropod portion of the Parasitology Course,
- 3) Insect portion of the Institutional Management Course on Natural History.

DIVISION OF INVERTEBRATE PALAEONTOLOGY
Curator - M. A. Fritz

Research Assistant - J. Monteith
Technician - D. Monteith

Accessions: A grant from the Advisory Committee on Scientific Research, University of Toronto, enabled the Curator to carry on a geological investigation last June in the vicinity of Coral Rapids, on the Abitibi River, in northern Ontario. Assisted by J. Monteith and Miss E. N. Hammell a large collection of Devonian fossils was obtained including the following: Plantae 58, Anthozoa 258, Stromatoporoidea 61, Brachiopoda 6, Bryozoa 6.

The Curator and Mr. H. A. Gorrell, a graduate student, made an extensive collection of Ordovician fossils from the Toronto subway excavation. The collection is of utmost importance in that the rocks from which the fossils were obtained have never before been available for study. Represented in

the collection are: Graptozoa 32, Stromatoporoidea 3, Bryozoa 316, Brachiopoda 115, Pelecypoda 266, Gastropoda 20, Cephalopoda 3, Trilobita 28.

The Research Assistant spent three days last October on field work visiting various localities on Georgian Bay and in the Bruce Peninsula. Ordovician and Silurian fossils collected include: Anthozoa 10, Brachiopoda 120, Bryozoa 2, Pelecypoda 23, Gastropoda 9, Cephalopoda 1, Trilobita 3.

We have received the following donations: From Professor B. F. Howell, Princeton, 8 Brachiopoda and 8 Trilobita, the genera represented filling important gaps in our collection. From Mr. Bruce Metcalfe of Thistletown, Ontario, twenty examples of a very significant new species of Ordovician Pelecypoda. The genus represented has not hitherto been reported from North America. From Mr. C. I. Grierson, President of Apco Industries, Leaside, Ontario, 2 Precambrian Algae of the genus Collenia from Alberta, no Canadian examples of which were represented in our collection; the donation included 2 Cambrian Trilobita and 3 Devonian Anthozoa. From Mr. Frank Joubin, consulting geologist, Toronto, 2 splendid Precambrian examples of the algal genus Cryptozoa from Richmond Gulf, Hudson Bay. From Dr. C. W. Fritz, Department of Resources and Development, Ottawa, 7 specimens of Tertiary foraminiferal limestones from Jamaica, British West Indies. We have received by exchange from Dr. Roman Kozlowski, Warsaw, Poland, 89 Palaeozoic species of invertebrates (involving many specimens) for his recent monograph entitled "Les Graptolithes et Quelques Nouveaux Groupes D'Animaux du Tremadoc de la Pologne."

The following is a summary of accessions:

Nature of Specimen	By Donation	By Staff Collection	By Purchase	By Exchange	Totals
Plantae	4	58	-	-	62
Foraminiferal limestone	7	-	-	-	7
Graptozoa	5	32	-	15	52
Stromatoporoidea	-	64	-	-	64
Anthozoa	3	268	-	-	271
Brachiopoda	8	241	-	63	312
Bryozoa	-	324	-	-	324
Pelecypoda	20	289	-	-	309
Gastropoda	-	29	-	-	29
Cephalopoda	-	4	-	-	4
Trilobita	10	31	-	11	52
Totals	57	1,340	-	89	1,486

Preparation, Registration and Maintenance: Considerable routine preparation is necessary in the case of fossil invertebrates before the specimens can be studied, exhibited or stored. Such preparation involves cleaning, repairing and freeing the fossils from the matrix. In certain instances, cutting, grinding and polishing are necessary to bring out details of structure. Furthermore, microscopic sections are often essential. Each of the 1,486 specimens noted in "Accessions" has thus been prepared, but none has as yet been registered. In addition to the above work one hundred 35mm. kodachrome lantern slides have been mounted for use in the teaching of earth history. With regard to "maintenance" twenty exhibition cases have been renovated.

A record of registered specimens which were acquired and prepared prior to June 1950 follows:

Registration:

Plantae (fucoid)	1
Porifera	1
Anthozoa	8
Crinoidea	3
Brachiopoda	282
Bryozoa (specimens)	43
Bryozoa (microscopic slides)	56
Pelecypoda	1
Gastropoda	43
Cephalopoda	10
Trilobita	51
Totals	499

Research: The Curator completed a study of the bryozoan genus Trachytoechus as represented in the Lower Devonian of Schoharie, New York. Two species, one new, have been described and figured in a paper to be published next November in the Wagner Free Institute of Science, Philadelphia.

Another study in progress is concerned with the pelecypod material presented by Mr. Bruce Metcalfe, to which reference has been made earlier in this report. The species represented is new and belongs to the genus Vlasta which is found in the Silurian of the Bohemian Basin but not previously recorded in North America. Since the rocks in which the genus is found in Europe are younger than those of the new occurrence, the present study may throw light on the area or place in which this very unusual pelecypod originated.

The Curator has directed the post-graduate studies of eight students who are proceeding to degrees in the Department of Geological Sciences.

Messrs. T. E. Bolton and B. A. Liberty, student assistants, compiled data for an index of the "University of Toronto Studies (Geological Series)" a publication which ran from 1900 to 1941 and which contained many valuable

palaeontological papers. This index will, it is hoped, be published later.

Education and Public Relations: In many ways assistance has been rendered to research workers during the course of the past year. In this connection the Curator examined bryozoan material submitted by Mr. A. J. Boucot, Harvard University. Assistance was also given to Dr. R. D. Hutchinson, Geological Survey of Canada, who spent two weeks at the Museum last autumn working on the Matthew Collection of Cambrian type specimens from the Maritime Provinces. Dr. Kenneth Oakley, of the British Museum, spent two days with us last July. He was shown the local geology and also taken to Niagara Falls, where he was again afforded an opportunity to observe the rocks and collect fossils. A small collection of fossils was identified for the Department of Lands and Forests.

Loan collections were sent upon request to Dr. O. M. B. Bulman, Sedgwick Museum, Cambridge, and to Dr. L. S. Russell, National Museum, Ottawa, the former interested in graptolites, the latter in non-marine molluscs.

Dr. Franco Rasetti, Johns Hopkins University, Baltimore, applied to us for latex casts and moulds of numerous trilobite types; he was very appreciative of the preparations forwarded to him.

Numerous requests from institutions were received for the scientific publications of this Division, among these requests may be noted: Manitoba Department of Mines and Natural Resources; Imperial Oil Limited, Calgary, Alberta; Cambrian Research Laboratory, Statesville, North Carolina; United States Geological Survey, Washington; Museum of Comparative Zoology, Cambridge; Geological Survey, New Zealand; Bureau of Geology, Canberra City, Australia; British Museum of Natural History, London; Professor M. LeCompte, Musee Royal d'Histoire Naturelle, Belgium.

As Associate Professor in the Department of Geological Sciences, the Curator gave the following University courses:

Post-Graduate	- "Stratigraphy and Palaeontology"
Fourth Year Honour	- "Stratigraphical Palaeontology"
Third Year Honour	- "Invertebrate Palaeontology"
Third Year Pass	- "Palaeontology"
Second Year Pass	- "Historical Geology"

The number of hours involved in the presentation of the above courses was 343.

The Division carried on a study group for the Toronto Junior Field Naturalists, which met on the first Saturday of each month from October to May inclusive.

Lastly, the usual routine requests, both verbal and written, for information regarding fossils and palaeontological problems in general, have been met by members of the staff.

DIVISION OF ART AND EXHIBITS

Chief - T. M. Shortt

Artist - A. Reid

Artist - E. Thorn

Two events of considerable importance to the Division occurred during the past year. Both were unforeseen a year ago and have resulted in a major revision of the Division's program.

First came the acquisition of a number of fine walnut gallery showcases from the Royal Ontario Museum of Archaeology. This accession has enabled the Division to dispose of the outmoded iron wallcases that have served to house much of the foreign collection in the south gallery since the opening of the Queen's Park wing. Because of lack of storage space for the newly-acquired cases, the task of dismantling and removing the old cases to make room for them had to be undertaken this year and other work was set aside.

The second was the initiation of discussions with the Dominion Department of Fisheries on a proposal to prepare, with the Department's financial assistance, a new alcove of fishes. An agreement has been worked out whereby the cooperative effort will provide a gallery of fishes that should be the most comprehensive in Canada. New display cases with modern interior lighting will be provided and the exhibit, which will occupy some thirteen hundred square feet of floor space, will deal with the anatomy, habits, distribution and systematics of Canadian fishes. It will also tell the story, through models of fishing boats and gear, of the Canadian fishing industry. A considerable amount of preliminary planning and research has already been done by the Division with the cooperation of the Curator of the Division of Ichthyology and Herpetology.

The Division completed the field work necessary for the production of the Carling Conservation Club - Royal Ontario Museum of Zoology wildlife project motion picture film for 1949-50. This entailed two more field trips of short duration to Pelee Island. The staff also assisted with scripting and editing the film.

Art: A cover-jacket design and several pen-and-ink drawings were prepared for the book "Ontario Birds" by Mr. L. L. Snyder. The Division's reference files of colour sketches and photographs were amplified by the addition of many items. Notable among these were sketches of west coast fauna by Mr. Thorn.

Exhibits: Utilizing the newly-acquired display cases previously mentioned, the Division has made a start on a new presentation of the foreign collections. This will be on a geographical rather than a taxonomic basis, and it is believed will have greater interest and be more useful to the Department of Education. The first of the new cases, one of three that will introduce the fauna of the Australasian region, has been completed. This exhibit features a number of the better known Australian and Papuan animals

against a colorful background and includes a map of the region indicating in a broad way the character of its vegetation. Work is progressing on the second of the three cases. Each specimen is repaired and cleaned before installation. In many cases this necessitates a considerable amount of work with wax, maché and paint since most of the Division's foreign material is thirty or more years old. Correspondence has been entered into with several Museums and scientific societies in various parts of the world in an effort to promote exchanges that will enrich the foreign collections.

At the same time work has continued on an exhibit dealing with the subject of size in animals and its significance. The largest and smallest known mammals, birds, reptiles, fishes and invertebrates are displayed, the larger ones by the use of scale models, and an attempt has been made to explain the advantages and disadvantages of extremes in size. The models include Whale Shark, Blue Whale and Giant Squid. During the year several fine specimens have been received in the flesh and have been processed for use in future exhibits. These include specimens for a tidal pool group and for an exhibit on nuptial and threat display by animals.

Only one art exhibit was hung, a selection of wildfowl studies by Mr. Robert Taylor of Sooke, British Columbia, before the art alcove had to be taken over for temporary storage of showcases. Seasonal or temporary exhibits included: Butterfly migration; polished shells of molluscs; comparison of skeletons of birds of different habits; sea-fans; four types of mammalian teeth; spring finery - the Enamelled Bird-of-Paradise. Three displays, all in the Museum building, were prepared to advertise the publications of the Royal Ontario Museum of Zoology.

A number of interesting foreign and native fishes was displayed during the year in the aquarium. These included - Golden Orfe from Holland, a selection of tropical aquarium fishes, and the native species - Sunfish, Black Crappie, Black Bass, Yellow Perch, etc. A special exhibit of aquarium plants with their names has proved to be popular.

Members of the Division gave three lectures and at their own expense visited Museums in Chicago, Victoria and Ottawa.

Mr. Reid's model of the Whale Shark was entered in the annual competition held in Montreal in connection with the convention of the Society of the Plastics Industry (Canada) Inc., and carried off the "Canadian Plastics" Achievement Award in the Science and Medicine Division. The award was particularly noteworthy in that competition came from firms throughout Canada that specialize in the production of plastic articles in the commercial field.

LIBRARY
Librarian - Miss E. McClure

Accessions: During the year there were 1,247 publications received and catalogued. This brings the total holdings of the library to 55,717.

We were fortunate in obtaining a series of the Proceedings of the Zoological Society of London for the period 1860 to 1890, thus filling a large gap in the library set of this publication. A number of maps, atlases and gazeteers was added to the geographical section of the library, and continued expansion of this section is planned, so that it will afford greater coverage for the preparation of distribution maps.

	By Exchange and Donation	By Purchase	Total
Bound books	19	26	45
Unbound periodicals	717	174	891
Separates and reports	310	1	311
Totals	1,046	201	1,247

Registration and Maintenance: Correspondence and mailings of publications have increased considerably since the library took over the sale of Museum publications. There were sales of 274 publications and 1,619 bird and mammal field-checking lists. New exchanges were arranged with several institutions, bringing the total to 170 and 560 publications were sent out during the year. There were 333 letters dealing with sales and exchange of publications as well as general enquiries.

The Museum's List of Publications was revised and includes the current publications: Contribution No. 32, Miscellaneous Publication No. 3, and Occasional Paper No. 9. The following publications have been discontinued, the last issue of each being shown in parenthesis: Circular (No.15), Bulletin (No. 9).

During the year, 32 volumes of periodicals were bound. A list of the periodicals were bound. A list of the periodicals in the library was compiled for inclusion in the forthcoming edition of "A Joint Catalogue of the Periodicals and Serials in the Libraries of the City of Toronto." Work has been started on cataloguing the separate collection. Stock cards of all separates are being typed, and will be filed in the library. The separates and the catalogue cards will be filed in the various Divisions. This arrangement will give much-needed space to the library, and will facilitate the use of the separates by the staff. This year the stocktaking of University books housed in the Museum library was done by the Museum Librarian, and this policy will be continued in the future.

ROYAL ONTARIO MUSEUM
OF ZOOLOGY AND PALAEONTOLOGY
STAFF PUBLICATIONS

Baillie, J. L.
Thrushes, Nuthatches and Near Relatives
(Canadian Nature, Vol. 12, 1950, p. 96).
Winter Season: Ontario-western New York Region
(Audubon Field Notes, Vol. 4, 1950, pp. 199-200).
Spring Migration: Ontario-western New York Region
(Audubon Field Notes, Vol. 4, 1950, p. 240).
Grouse, Pheasants, Cranes and Rails
(Canadian Nature, Vol. 12, 1950, p. 132).
Nesting Season: Ontario-western New York Region
(Audubon Field Notes, Vol. 4, 1950, pp. 272-4).
Fall Migration: Ontario-western New York region
(Audubon Field Notes, Vol. 5, 1951, pp. 11-14).
The Wood Warblers
(Canadian Nature, Vol. 13, 1951, p. 100).
Downing, S. C.
The Rocky Mountain Bighorn
(Canadian Nature, Vol. 12, 1950, pp. 140-151).
The American Bison
(Canadian Nature, Vol. 13, 1951; pp. 24-25).
Mammals of an Eastern Farmer's Field
(Canadian Nature, Vol. 13, 1951, pp. 67-69).
Logier, E. B. S.
Amphibian and Reptile
(Canadian Nature, Vol. 13, 1951, pp. 110-111).
Peterson, R. L.
Management of Moose
(Proc. 39th Conv. Internat. Assoc. Game, Fish and
Conservation Commissioners: 1949, pp. 71-75).
A New Subspecies of Moose from North America
(Occ. Pap. Roy. Ont. Mus. Zool., No. 9, 1950, pp. 1-7).

